

**IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF PENNSYLVANIA**

CRYSTAL IMAGE TECHNOLOGY,)	
INC.,)	
)	
Plaintiff,)	Civil Action No. 08-307
)	
v.)	Chief Judge Lancaster
)	Magistrate Judge Bissoon
MITSUBISHI ELECTRIC CORP.,)	
)	
Defendant.)	

**MAGISTRATE JUDGE’S REPORT AND
RECOMMENDATION ON CLAIM CONSTRUCTION**

I. RECOMMENDATION

In this patent infringement lawsuit, it is respectfully recommended that the parties’ disputed claim terms be construed as specified below.

II. REPORT

BACKGROUND

Plaintiff Crystal Image Technology, Inc., alleges that Defendant Mitsubishi Electric Corp. infringed the claims of U.S. Patent 6,078,038 (“the ‘038 Patent” or “the Patent”), entitled, “[a]pparatus and method for displaying a high resolution image with relatively lower resolution display device.” *Id.*, col. 1 lin. 1-4.

The Patent contemplates the division of a high resolution image into lower resolution frame images, which subsequently are “interleaved” through the use of correction optics, thereby recreating the high resolution image. *See generally id.*, col. 10 lin. 31-48. The frame images are displayed on a display device that is of a lower resolution than the original high resolution image. *Id.*

Absent the invention, the display device could not display the high resolution image in its entirety. *Id.* Through the Patent's technology, however, the frame images are woven together, in a time sequential fashion, to display the original high resolution image. *Id.* Although the display device only displays one frame at a time, the eye's persistence of vision causes the viewer to see the plurality of frames, in the form of one high resolution image.

For the purposes of claims construction, the parties have identified ten disputed terms. *See generally* Am. Claim Chart (Docket No. 44). A *Markman* hearing was held on October 6, 2009, and the parties have filed briefs and evidence regarding the disputed claims.

ANALYSIS

A. "Image"

Plaintiff's proposed construction of the term "image" is:

Image, depending on the context, may refer to a virtual image, or an image on a recording medium. It includes the claimed image to be displayed, which is a high resolution image [that] has been recorded as a frame and is to be displayed.

Revised Joint Disputed Claim Terms Chart (Docket No. 44-2 at 1) ("DCTC").

Plaintiff's definition is derived from the Patent's specification, which states:

The term image is meant to include all the various forms of the image, for example the image on the film, the image on the Sense CCD array, the image as projected on the projection screen, the image being recorded, the image stored as electronic information and the image on the recording sensor. *Image, depending on the context, may refer to a virtual image, an image on a recording medium such as electrons with a memory, film or tape, emulsion, ink, chemicals or other particles on a base such as film or paper.* The word image is to be interpreted with breadth unless specifically defined as to pertaining to a particular form.

‘038 Patent, col. 11 lin.13-24 (emphasis added). Plaintiff also highlights specification language indicating:

Images may be recorded in high resolution with subsequent display of each high resolution image with a display device which displays a plurality of frames of lower resolution images.

See id., col. 10 lin. 33-36.

Defendant, on the other hand, relies on the fourth definition of “image” provided in the IEEE Dictionary, Fifth Edition (1993) (“IEEE Dictionary”), which identifies “[a] two-dimensional representation of a scene.” *See* Def.’s Br. (Doc. 47) at 14 (citing and quoting 4th definition of “image”). In support of this construction, Defendant highlights that the inventor referenced the IEEE Dictionary in amending an earlier, related patent (“the Related Patent”).¹ Although the Related Patent, as amended, recites the IEEE Dictionary’s first definition of “image,” regarding “the field of optoelectronic devices,” Defendant argues that the fourth definition should be adopted “because the ‘038 Patent is more generally related to image processing than it is to any particular optoelectronic device,” and because using the latter definition “would define the term in a way that would be helpful to [a] jury without injecting unnecessary concepts.” *See* Def.’s Br. at 14-15.

Having carefully reviewed the parties competing proposals, the undersigned concludes that the Court’s construction should contain elements of both.

¹ The ‘038 Patent “is part of a family of patents,” reflected in “a series of what are called divisional applications.” *See* Markman Tr. (Doc. 54) at 5-6. Divisional applications “share a common specification, common drawings, [and] common disclosure[s], but are claimed for different inventions.” *See id.* at 6. The “Related Patent,” as referenced above, refers to the earliest divisional application filed by the inventor.

As for Defendant's construction (*i.e.*, "[a] two dimensional representation of a scene"), this language does not conflict with the intrinsic evidence and is useful in providing context regarding the term. Restricting "image" to this definition, however, would be to ignore passages of the Patent specification and history, identified by Plaintiff, that also would inform a person of ordinary skill in the art.

Turning to Plaintiff's proposed construction, Defendant's arguments in opposition are persuasive in some respects, and in others not. Defendant first argues that the Patent's specification does not define "image," noting that the definition in the prior, Related Patent was secured only by way of amendment. *See generally* Def.'s Br. at 13-14. Defense counsel appear to suggest that, because the Related Patent was amended and the '038 Patent was not, the term "image" is not defined here. *See id.*

Plaintiff correctly responds, however, that the amendment to the Related Patent, providing an explicit definition of the term "image," was not considered "new matter" by the examiner. Because it was not new matter, the examiner must have found that "image" already was supported by the Related Patent's specification. *See Schering Corp v. Amgen*, 222 F.3d 1347, 1352 (Fed. Cir. 2000) (to avoid prohibition against asserting new matter through amendment, applicant must show that original application supports proposed amendment); *cf. also CFMT, Inc. v. YieldUP Intern. Corp.*, 92 F. Supp.2d 359, 373 (D. Del. 2000) (divisional applications with same written description and identical terms should be interpreted consistently) (citation omitted), *rev'd on other grounds*, 349 F.3d 1333 (Fed. Cir. 2003). In any event, Defendant's argument that the '038 Patent did not define "image," and that, therefore, the Court should rely exclusively on an IEEE Dictionary definition not contained in the prosecution history, is unconvincing.

Defendant next argues that the Patent's specification does not require that the image be recorded and/or recorded as a frame. *See generally* Markman Tr. at 19 (summarizing Defendant's argument that Plaintiff's proposed construction improperly reads limitations from specification). The Court agrees with Defendant that the specification's discussion regarding what the invention "may" entail is not controlling, and that the Patent claims contain no express requirement that "image" must be recorded or recorded as a frame.

Last, Defendant argues that Plaintiff's construction would be unhelpful to a jury. Defendant's argument is somewhat persuasive, because a key aspect of the term "image" is its context-specific use in the claims. Claim 3 of the Patent, for example, reads:

3. The method of displaying an *image* of a first resolution which is made up of image elements, said method utilizing a display device of lower resolution and including the steps of:
 - a) providing a first set of display elements in response to said image elements;
 - b) using said first set of display elements to display a first lower resolution *image* with said display device;
 - c) providing at least a second set of display elements in response to said image elements;
 - d) using said second set of display elements to display a second lower resolution *image* with said display device after said display of step b);
 - e) optically altering the display of at least one of said first and said second lower resolution *images* in order that individual image *elements* of each said set are displaced from each other when displayed.

'038 Patent, col. 12 lin. 1-17 (emphasis added).

A person of ordinary skill in the art would understand that the term “image,” as used in the first line of claim 3, refers to the input “image” to be displayed; whereas the “image” referenced used in parts (b) and (d) refer to the output “image” that is displayed on the display device. As such, the term “image,” depending on the context within which it is recited, refers to the input image to be displayed or the output display image.

Furthermore, the output “image” is not what is ultimately perceived by the viewer; rather, the inputted image is recreated through the interleaving of output display images, and that is what is seen by the viewer. As a result, a construction that accommodates the context specific, input and output meanings of “image” best captures the scope of the claims.

Consistent with the discussions above, the District Court should adopt the following construction:

An image is a two dimensional representation of a scene, that depending on the context, may refer to the image to be displayed or to the image on the display device that is to be interleaved to recreate the image to be displayed.

B. “Resolution”²

Plaintiff’s proposed construction for “resolution” is “the level of visual quality or detail.” DCTC at 6. Defendant’s construction is “[t]he fineness of an image, as in the number of image elements (pixels) making up the image. For example, a higher resolution image would have more image elements (pixels) than a lower resolution image.” *Id.*

² The District Court should overrule Plaintiff’s timeliness objection to Defendant’s proposed construction of “resolution.” *See generally* Pl.’s Br. at 19. Construction of the term will be useful; Plaintiff has provided its own proposed definition; and, otherwise, Plaintiff has failed to demonstrate that it has been prejudiced.

“Resolution” is used in claims 3, 6, and 7. In relevant part, those claims read:

3. [A] method of displaying an image of a first *resolution* which is made up of image elements, said method utilizing a display device of lower *resolution* and including the steps of:

a) providing a first set of display elements in response to said image elements;

b) using said first set of display elements to display a first lower *resolution* image with said display device; . . .

6. An apparatus for displaying an image made up of a first number of image elements arranged in an array of lines of elements thereby having a first *resolution*, said apparatus using a display device which displays a second lower number of display pixels arranged in a frame, said apparatus including:

a) a frame circuit responsive to said image and providing a plurality of lower *resolution* frames of said image elements as compared to said first *resolution*, said plurality of lower *resolution* frames including a first frame and second frame . . .

‘038 Patent, col. 12 lin. 1-8, 30-40 (emphasis added); *see also id.* at col. 12 lin. 49-60 (claim 7, containing materially similar language). Resolution also is discussed in the specification:

Images may be recorded in high *resolution* with subsequent display of each high *resolution* image with a display device which displays a plurality of frames of lower *resolution* images.

‘038 Patent, col. 10 lin. 33-36 (emphasis added).

“Resolution” is used to reflect a measure of comparison between the image to be displayed and the frame images and display device. The image to be displayed is identified as a high resolution image, and the frame images and display device are said to be of a lower resolution. Claim 6 supports this conclusion, referencing “a plurality of lower resolution frames

of said image elements as *compared* to [the] first resolution.” *Id.*, col. 12 lin. 37-38. (emphasis added).

Claim 6 also identifies “an image made up of a first number of image elements[,] arranged in an array of lines of elements[,] *thereby* having a first resolution.” *Id.*, col. 10 lin. 30-33 (emphasis added). Thus, the resolution of the image is determined by the number of image elements it contains. This is consistent with an embodiment recited in the specification, where a 200 pixel-width higher resolution image is created from two 100 pixel-width lower resolution frames. *See id.*, col. 10 lin. 39-42. As a result, a person of ordinary skill in the art would understand the term “resolution” to mean the fineness of an image, as measured by the number of image elements or pixels making up the image.

Plaintiff argues that “resolution” should have a broader construction, including specification of pixel clarity and size. Plaintiff also argues that, contrary to Defendant’s suggestion, “pixels” and “image elements” do not have the same meaning.

In support of its position, Plaintiff relies on the prosecution history, where claims 6 and 7 were rejected for indefiniteness. The examiner stated that the relationship between the different image elements, and the manner in which the image and frames were deemed “high” or “low” resolution, were unclear. (Docket No. 40-3 at 24). In response, the patentee amended claims 6 and 7 as follows:

An apparatus for displaying [a higher resolution] an image made up of a first number of image elements arranged in an array of lines of elements thereby having a first resolution, said apparatus using a display device which displays a second lower number of [image elements] display pixels arranged in a frame. . . .

(Docket No. 40-3 at 31) (underlining reflects language added; brackets, text omitted).

The patentee amended claims 6 and 7 “to more clearly point out and specify the invention by referring to display pixels instead of image elements and making the term lower resolution more definite in relation to the first resolution.” (Docket No. 40-3 at 35).

Plaintiff argues that the phrase “image elements” was changed to “display pixels” in order to secure patentability, and now treating the terms interchangeably would be to render the amendment meaningless. Plaintiff also argues that, under the doctrine of claim differentiation, the terms “pixel” and “image element” are presumed to have different meanings. In essence, Plaintiff argues that image elements can be, but are not limited to, pixels.

The undersigned disagrees. The prosecution history does not indicate that “display pixel” has a narrower meaning than “image element.” Rather, in response to the examiner’s initial rejection, the patentee offered clarification regarding how the lower resolution display device and frame image were to be compared with the higher resolution image to be displayed. Viewing the prosecution history from the perspective of person of ordinary skill in the art, the patentee’s amendment merely clarified that the “image elements” of the display device were “display pixels,” for the purpose of overcoming the examiner’s concerns regarding clarity.

As for claim differentiation, that doctrine merely acts as a guide when the claims terms compared are present in two different, independent claims. *See generally* Curtiss-Wright Flow Control Corp. v. Velan, Inc., 438 F.3d 1374, 1380-81 (Fed. Cir. 2006). Although “[d]ifferent claims with different words can . . . define different subject matter[,] . . . claim drafters can also use different terms to define the exact same subject matter.” *Id.* (citations omitted); *see also* Andersen Corp. v. Fiber Composites, LLC, 474 F.3d 1361, 1370 (Fed. Cir. 2007)

(“overlapping patent claims are not unusual, and the overlap does not require us to construe . . . claims to cover subject matter that differs from the subject matter covered by [other] claims”).

Here, claim 11 uses the term “pixel,” whereas “image elements” is used in claims 1-4, 6 and 7. Although claim 11 is an independent claim, the use of the term “pixel” is not the only difference between that claim and the others. As a result, there is no redundancy in claim 11 if “pixel” is given the same meaning as “image element.”³

In sum, the Patent’s use of the term “resolution” reflects a measure of comparison. In claims 2, 6 and 7, the resolution of the image to be displayed is compared to the resolution capabilities of the display device. This is accomplished by comparing “a first number of image elements” from the image to be displayed with “a second smaller” or “second lower” number of display pixels. ‘038 Patent, col. 11 lin. 55-58; col. 12 lin. 30-34, 48-52. Given that the resolution comparison is made between a number of image elements and a number of display pixels, it follows that “image elements” and “display pixels” must reflect the same unit of measure. Otherwise, the Patent would compare “apples to oranges.”⁴

³ The non-binding decision cited by Plaintiff, IP Innovation L.L.C. v. Lexmark International, Inc., 424 F. Supp.2d 1078 (N.D. Ill. 2006), is distinguishable. In IP Innovation, the court found that the terms “pixel” and “image element” had different meanings. The patent claims there, however, did not establish a direct connection between the number of image elements and the number of pixels. *Cf. id.* at 1087-88. Additionally, the patents in IP Innovation presented dependent claims that narrowed image elements to pixels, thus properly warranting an invocation of claim differentiation. *See id.*

⁴ The Court is cognizant that limitations cannot be read into the Patent claims from the specification. This is not an issue here, however, because a person of ordinary skill in the art would appreciate that, under the Patent, resolution is determined by counting the number of pixels in an image. *See* ‘038 Patent, col. 10. lin. 39-46 (display device resolution is determined by counting number of display pixels, and example in specification uses pixel count to define resolution of images).

For all of the reasons stated above, “resolution” is the fineness of an image, as measured by the number of image elements or pixels making up the image.

C. “Image Element”

Plaintiff argues that an “image element” is “a component of the . . . the high resolution image [that] has been recorded.” DCTC at 1. Defendant claims that “image element” is “[t]he smallest elements of an image that can be assigned independent characteristics.” *Id.*

The parties do not dispute that the plain and ordinary meaning of “pixel” is the smallest complete element of an image. Plaintiff opposes Defendant’s construction, however, arguing that it would prevent “image element” from identifying something that is a portion of something larger, such as a sub-pixel. Defendant denies that its construction would require an “image element” to be complete, or that it would preclude a sub-pixel. *See* Def.’s Br. at 16 n. 9.

Defendant’s construction reflects the plain and ordinary meaning of “pixel.” As found above, moreover, “image element” should be construed synonymously with that term. Thus, “image element” means the smallest element of an image that can be assigned independent characteristics.

D. “Display” and “Display Device”

Plaintiff argues that “display” and “display device” should be defined as “a structure for presenting an image visually.” DCTC at 1. Defendant proposes that the terms mean “an output device on which display images can be represented.” *Id.* These opposing constructions reflect disagreement regarding whether the display device “presents” images, or, alternatively, only “represents” images “on” the device.

Plaintiff argues that Defendant's construction would exclude devices such as printers and projectors, because they do not have images represented "on" them. Printers and projectors are identified in the Patent's specification, *see id.* (col. 1. lin. 18-24), and Plaintiff therefore urges adoption of its broader construction.

Defendant responds that "display device," as used in the Patent, means a component of the apparatus rather than the apparatus as a whole. Consistent with Defendant's position, the prosecution history indicates that the patentee regarded an LCD display as an example of a "display device." (Docket No. 40-3 at 19).⁵

Defendant also argues, and the Court agrees, that Defendant's proposed construction does not limit "display device" to any particular type of device. There is no basis for concluding that the devices identified by Plaintiff, namely printers and projectors, should be precluded from Defendant's construction.⁶

Defendant's construction best incorporates the concept that the display device is a component of the apparatus, including devices such as printers and projectors. Plaintiff's use of the term "structure," although not necessarily limiting, could be confused with the idea that the display device is the entire apparatus rather than a component. The term "output device" better captures the notion that the display device is a component of the invention.

⁵ Although this portion of the prosecution history is instructive, the District Court should reject Defendant's suggestion that the patentee disavowed embodiments beyond an LCD display. The doctrine of prosecution disclaimer requires "a clear and unmistakable disavowal of scope during [the] prosecution," *see Purdue Pharma L.P. v. Endo Pharm. Inc.*, 438 F.3d 1123, 1136 (Fed. Cir. 2006) (citations omitted), and the patentee's statements fall short of this standard.

⁶ Plaintiff argues that a printer is not a device upon which images are represented. The Patent requires that an image be optically displayed on something, however, and there appears no reason why a printer or projector cannot be considered a component of a display device, given that the printout or projection image eventually must be displayed.

Consistent with the foregoing analyses, “display” and “display device” should be construed as an output device on which display images can be represented.

E. “Frame”

Plaintiff’s proposed construction of “frame” is “a complete digital image from a series of high resolution image frames (that have been recorded), forming a cinema, television or video image.” DCTC at 4. Defendant’s proposed construction of “frame” is “a single display image analogous to a frame in a motion picture.” *Id.*

In essence, the parties disagree regarding whether a “frame,” as referenced in the ‘038 Patent, refers to a spatially complete image. Plaintiff relies on technical dictionary definitions, arguing that a person of ordinary skill in the art would understand “frame” to be a complete image.⁷ Defendant points out, however, that the “frame” in the ‘038 Patent is more akin to a “field,” as used within the context of televisions, because the claims envision a plurality of “frames” being combined to form the image perceived by the viewer.⁸

The undersigned concludes that a person of ordinary skill in the art would afford the term “frame” its ordinary meaning, *i.e.*, a spatially complete image, only with respect to how it is displayed on the display device. Within the context of the image to be displayed (*i.e.*, seen by

⁷ See, e.g., Docket No. 46-8 at 5 (in multimedia applications, “frame” is “a complete television picture that is composed of two scanned fields, one of the even lines and one of the odd lines”); Docket No. 46-10 at 4 (frame is “[t]he total amount of information presented on a display at one time”); Docket No. 46-11 at 41 (in computer graphics, frame “is often used to designate the storage space for one screenful of data”) (citations to technical dictionaries omitted).

⁸ For the purposes of televisions, “[f]ield” is defined as “[o]ne of the two or more equal parts into which a frame is divided in interlace scanning.” See Docket No. 48-15 at 4 (excerpt of New IEEE Dictionary of Electronic & Electrical Terms, 492 (5th ed. 1993)).

the viewer), the “frame” is akin to a field, in that a plurality of frames are combined to form a complete image.⁹

For these reasons, “frame” should be construed to mean a spatially complete image with respect to how it is displayed on the display device, and an incomplete fractional image of the image to be displayed with respect to the image seen by the viewer.

F. “Providing said set in response to said first number of image elements”; “Selecting a set of said image elements”; and “A set of display elements in response to said image elements”

Plaintiff’s proposed construction for these phrases is: “[g]enerating a spatially complete image comprising a set of lesser number of image elements in response to the first number of image elements.” DCTC at 1-3. Defendant proposes, respectively: “[p]roviding a group of elements from the elements of the image to be displayed”; “[s]electing a group of elements from the elements to be displayed”; and “[a] group of elements form the image to be displayed.” *Id.*

The parties disagree in three ways. First is whether the group or set of elements comes from the image to be displayed.

Defendant correctly notes that, under the Patent, the image elements of the sets derive from the image elements of the image to be displayed. In claim 1, for example, the language “said first number of image elements” finds its antecedent basis in the preamble language, “an image comprising a first number of image elements.”¹⁰ Similarly, in claims 2 and 3,

⁹ The “sets” referenced in claims 1, 2 and 3 echo this concept, given that spatial completeness or incompleteness depends on what the “sets” are compared to.

¹⁰ Preamble language may be used to define the scope of a patent claim if the preamble “recites [an] essential structure that is important to the invention or necessary to give meaning to the claim.” *Bicon, Inc. v. Straumann Co.*, 441 F.3d 945, 952 (Fed. Cir. 2006) (citations omitted). Where, as here, the body of the claim “rel[ies] upon and derive[s] antecedent basis from the

“said image elements” is based on the preamble language referring to the image elements making up the image. Thus, the Patent claims require that the sets provided or selected be derived from the image elements of the image to be displayed.

Plaintiff argues that this construction may lead to confusion, given that the display device is displaying the “image to be displayed,” rather than a set or frame of lesser number image elements. Any such confusion, however, is ameliorated by the Court’s adoption of language indicating that the sets have a lesser number of image elements than the image to be displayed, and therefore have a lower resolution than the image to be displayed. *See* recommended construction, *infra*.

The parties’ second disagreement is whether the term “generating,” as used in Plaintiff’s proposed construction, is equivalent to “providing” and/or “selecting.” According to Plaintiff, it references “generating” merely in an attempt to avoid repeating the terms “selecting” and “providing.”

As Defendant correctly notes, “generating” appears nowhere in the intrinsic evidence, and there is no need to determine whether the term has the same meaning as “providing” and/or “selecting.” It is unnecessary to paraphrase the Patent’s claims language where it can be understood through ordinary meaning. *See Stanacard, LLC v. Rebtel Networks*, -- F. Supp.2d --, 2010 WL 46006, *10 (S.D.N.Y. Jan. 6, 2010) (where claim term has ordinary meaning, proposed construction “paraphrasing” claim language “offers little to assist one of skill in the art in understanding the claim[.]”) (citation omitted).

preamble,” the preamble acts “as a necessary component of the claimed invention.” *Id.* (citation to quoted source omitted).

Last, Plaintiff argues that Defendant’s proposed construction reads out the language in claims 1 and 3 that “providing” and “selecting” is done “in response to” the image elements of the image to be displayed. Plaintiff highlights an embodiment in the Patent stating: “an image is recorded with 200 pixels across the image width[, where the] first frame is displayed *utilizing* all the odd pixels, 1, 3, 5, *etc.*[,] followed by a second frame display of all of the even pixels 2, 4, 6, *etc.*” See ‘038 Patent, col. 10 lin. 40-43 (emphasis added). As a result, the specification indicates that, “in response to” the image to be displayed, the image elements of the image to be displayed are utilized to provide or select the frames or sets. Plaintiff’s point is well taken, and the construction recommended below reflects that the utilization of image elements of the image to be displayed is done “in response to” the image elements.¹¹

For all of the reasons stated above, the District Court should adopt the following constructions:

“Providing . . . said . . . set in response to said first number of image elements” means providing a group of elements from the image to be displayed by utilizing a lesser number of image elements from the image to be displayed.

“Selecting . . . a . . . set of said image elements” means selecting a group of elements lesser in number than elements from the image to be displayed, from the elements of the image to be displayed.

¹¹ The only other disagreement regarding this group of claim terms is whether a set is a “spatially complete” image. The Court already has resolved this issue through its construction of “frame.” See discussion *supra* (sets and frames are a spatially complete image with respect to the display device, and they are incomplete image fields with respect to the image to be displayed).

“Providing a . . . set of display elements in response to said image elements” means providing a group of elements from the image to be displayed by utilizing a lesser number of image elements from the image to be displayed.

G. “Interleaved” and “Interleaving”

According to Plaintiff, “interleaved”/“interleaving” is “[the] merging [of] two different frames of an image such that a given line of the merged image includes alternating image elements from each frame.” DCTC at 4. Defendant asserts that the terms mean “arranged so that parts of one sequence of things alternate with parts of another sequence of things, such that each sequence retains its identity.” *Id.*

The parties seem to agree upon the basic concept of “interleaving,” *i.e.*, frames are separately displayed along an optical path to create an illusion whereby the viewer perceives a single, higher resolution image. Defendant’s construction, however, seeks to prohibit the frames from overlapping.¹²

In support of its position, Defendant highlights language in the specification indicating that pixels of one frame are displayed between the pixels of the other. *See* ‘038 Patent, col. 10 lin. 43-46 (“[d]uring the display of the second frame the correction optics cause[] the image to shift by a pixel width, causing pixel 2 to be displayed *between* pixels 1 and 3, 4 *between* 3 and 5, *etc.*” (emphasis added)). Defendant reads “between” to mean that overlapping pixels are not contemplated and/or permitted.

¹² In its proposed construction, Defendant interprets the phrase, “each sequence retains its identity,” to mean that image elements cannot overlap. *See, e.g.*, Def.’s Br. at 21 (quoting IEEE Dictionary’s definition of “interleav[ing],” stating that “each sequence retains its identity”). The Court is unconvinced, however, that “retains its identity” means that images may not overlap. In any event, the parties have focused almost exclusively on the issue of whether or not there may be overlap, and the Court will restrict its discussions accordingly.

Defendant also refers to the prosecution history, through which the patentee indicated that the prior art in *Takahashi* presented interleaving. (Docket No. 40-3 at 36). According to Defendant, figure 50 in *Takahashi* establishes that the pixels are interleaved between each other, without any overlap. (Docket No. 48-5 at 34).

Having carefully reviewed *Takahashi* figure 50, however, the Court finds it uninformative regarding whether or not there is overlap. Even more importantly, *Takahashi* expressly states that four component images are interleaved “by shifting a half pixel for each interleaved image such that each light aperture portion of one image overlaps with the light shield portion of the other images.” (Docket No. 48-5 at 36-37, col. 2 lin. 8-11) (emphasis added). In view of this intrinsic evidence, Defendant’s reading of *Takahashi* is misguided.

Turning to the Patent itself, the specification provides an example where the frame pixels are shifted by one pixel width, but it is silent regarding the width of the gap between the pixels in an individual frame. If the pixel gap were less than one pixel in width, the shifting of the second frame by one pixel would still result in an overlapping of the two frames. As a result, the specification’s discussion of shifting by one pixel neither prohibits nor requires overlapping.¹³

¹³ As referenced above, *Takahashi* contemplates that overlapping be achieved by shifting the images a half pixel width. See discussion *supra* in text. Given that *Takahashi* achieves interleaving by shifting a half pixel, a person of ordinary skill in the art would understand that the width of image shift is not limited to exactly one pixel. Thus, the example in the Patent specification cannot be read as limiting the shifting of images by one pixel width; nor does the example preclude the overlapping of frames.

In sum, the Patent neither precludes nor requires that interleaved frames overlap. Thus, “interleaved”/“interleaving” should be construed as the merging of two different frames of an image, with or without overlap, such that a given line of the merged image includes alternating image elements from each frame.¹⁴

H. “A plurality of lower resolution frames of said image elements including a first frame and a second frame”

Plaintiff’s proposed construction is:

Two or more complete images, which are versions of the high resolution image to be displayed, each having a lesser number of image elements than the ‘first number of image elements’ of that image.

DCTC at 4-5. Defendant proposes:

Two or more frames of the elements of the image to be displayed, where each frame includes fewer elements than the number of elements of the image to be displayed.

Id.

The parties’ disagreements are the same as those reflected in their proposed constructions regarding “frame” and “providing . . . said . . . set in response to said first number of image

¹⁴ Although *Takahashi* discussed the interleaving of “four component images,” the parties here contemplate only two. See discussion *supra* (according to Plaintiff, interleaving is “[the] merging [of] two different frames of an image”) see also Def.’s Br. at 20-21 (according to Defendant, interleaving means “arrang[ing] so that parts of one sequence of things alternate with parts of another sequence of things,” despite IEEE Dictionary’s reference, in second clause of definition, to “one or more other sequences of things”) (emphasis added). For the purposes of claim construction, the Court addresses “only those terms . . . that are in controversy, and only to the extent necessary to resolve the controversy.” See *Vivid Tech., Inc. v. American Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999) (emphasis added, citation omitted). The undersigned’s definition of interleaving, therefore, contemplates the merging of two frames. Nothing in this Report, however, should be read to state an opinion regarding the number of permissible component images outside of the context of this litigation.

elements.” Specifically, Plaintiff relies on the notion that a “frame” is spatially complete, and Defendant asserts that frame elements are derived from the image to be displayed. As the Court already has concluded, the term “frame” incorporates both spatial completeness and incompleteness, depending on context. *See* discussions *supra*. Accordingly, there is no need to adopt the word “complete,” as contemplated in Plaintiff’s construction.

Furthermore, akin to “sets,” the “lower resolution frames” are derived from “said image elements” of the image to be displayed. ‘038 Patent col. 12. lin. 30-38. As a result, Defendant’s proposed language is most consistent with the constructions recommended above.

Thus, “a plurality of lower resolution frames of said image elements including a first frame and a second frame” means two or more frames of the elements of the image to be displayed, where each frame includes fewer elements than the number of elements of the image to be displayed.

CONCLUSION

For all of the reasons stated above, the District Court should adopt the following claim constructions:

Image means “a two dimensional representation of a scene, that depending on the context, may refer to the image to be displayed or to the image on the display device that is to be interleaved to recreate the image to be displayed.”

Resolution means “the fineness of an image, as measured by the number of image elements or pixels making up the image.”

Image Element means “the smallest element of an image that can be assigned independent characteristics.”

Display and **Display Device** mean “an output device on which display images can be represented.”

Frame means “a spatially complete image with respect to how it is displayed on the display device and an incomplete fractional image of the image to be displayed with respect to the image seen by the viewer.”

Providing . . . said . . . set in response to said first number of image elements means “providing a group of elements from the image to be displayed by utilizing a lesser number of image elements from the image to be displayed.”

Selecting . . . a . . . set of said image elements means “selecting a group of elements lesser in number than elements from the image to be displayed, from the elements of the image to be displayed.”

Providing a . . . set of display elements in response to said image elements means “providing a group of elements from the image to be displayed by utilizing a lesser number of image elements from the image to be displayed.”

Interleaving and **Interleaved** mean “the merging of two different frames of an image, with or without overlap, such that a given line of the merged image includes alternating image elements from each frame.”

A plurality of lower resolution frames of said image elements including a first frame and a second frame means “two or more frames of the elements of the image to be displayed, where each frame includes fewer elements than the number of elements of the image to be displayed.”

In accordance with the Magistrates Act, 20 U.S.C. § 636(b)(1) (B) and (C), and Rule 72.D.2 of the Local Rules for Magistrates, objections to this Report and Recommendation are due by April 23, 2010. Responses to objections are due by May 7, 2010.

April 9, 2010

cc (via email):

All Counsel of Record

s/Cathy Bissoon
Cathy Bissoon
United States Magistrate Judge